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A KEY TO

THE COMMON FAMILIES OF SEED PLANTS

IN THE CENTRAL UNITED STATES

WITH GLOSSARY

BY

JOHN H. SCHAFFNER

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BY

JOHN H. SCHAFFNER
Associate Professor of Botany
OHIO STATE UNIVERSITY.

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1903.

The families included in the following key represent those growing in the territory from Ohio to Kansas. The number following each family refers to the page on which the family will be found in Britton's Manual of the Flora of the Northern States and Canada, 1901. All important terms used are defined in the glossary which should be consulted frequently by the student; otherwise confusion will probably result, since some of the older terms are misleading or even incorrect. In deciding on any character or set of characters the student, unless absolutely certain, should read all the paragraphs of a given number before making a final disposition of the case. This will usually prevent him from going on the wrong track.

KEY TO THE FAMILIES.

Series III.

SPERMATOPHYTA.

1. Ovules naked on an open carpel; pollen falling directly on the ovule; trees or shrubs; ours usually evergreen with narrow leaves; monoecious, rarely dioecious. 2.

1. Ovules in a closed carpel which is provided with a stigma for the reception of the pollen; flowers more commonly showy. 4.

2. GYMNOSPERMAE.

2. Carpellate flowers developing as woody cones, the carpels arranged in spirals or opposite, each with 2 inverted ovules, or by coalescence forming a black or blue berry. 3.

2. Carpellate flowers developing as red berries, fleshy with a bony seed; staminate cone (flower) consisting of 5–8 peltate stamens, 4–6–locular; evergreen trees or shrubs with spirally arranged, linear, flat, mucronate leaves spreading into 2 ranks.
TAXACEAE. (37).

3. Leaf-buds scaly; carpels usually numerous; leaves spirally arranged, the foliage leaves often situated on dwarf branches.
PINACEAE. (30).

3. Leaf-buds naked; carpels few, sometimes forming a black or blue berry; leaves opposite or whorled, rarely scattered.
CUPRESSACEAE. (30).

4. ANGIOSPERMAE.

4. Leaves mostly parallel-veined, sometimes netted-veined; parts of the flower very often in threes (trimerous); cotyledon 1; vascular bundles scattered through the pith, usually not in a circle; no annual rings of growth. 5.

4. Leaves usually netted-veined; parts of the flower more commonly in fives (pentamerous) or fours (tetramerous); cotyledons usually 2; vascular bundles usually in a circle around a central pith, forming annual rings of growth in perennial stems, with bark on the outside. 17.

5. MONOCOTYLEDONES.

5. Flowers crowded on a spadix or fleshy axis, with or without a spathe; usually without perianth; leaves sometimes netted-veined; or plants minute without leaves, floating free. 6.

5. Flowers not on a spadix; usually with perianth; leaves parallel- or netted-veined. 8.

5. Flowers covered with glumes, destitute of a proper perianth which is when present represented by minute scales or bristles; flowers in spikes and panicles or variously clustered. 7.

5. Flowers in a close cylindrical spike terminating the stem, destitute of a perianth; monoecious, the staminate flowers above, the carpellate below; reed-like marsh or aquatic herbs with large linear leaves. TYPHACEAE. (38).

5. Flowers in spherical heads scattered along the summit of the stem, destitute of a proper perianth; monoecious; aquatic or marsh herbs with large linear leaves. SPARGANIACEAE. (39).

6. Small floating usually disc-like aquatics with no distinction of stem and leaves. LEMNACEAE. (232).

6. Terrestial or marsh plants, mostly with distinctly netted-veined petioled leaves; monoecious or dioecious: or reed-like plants with bisporangiate flowers on a lateral spadix, with perianth of 6 divisions. ARACEAE. (229).

7. Flowers inclosed in a pair of glumes (palet and flowering glume), naked or with 2 or 3 small bracts (lodicules); stem hollow or solid. GRAMINACEAE. (61).

7. Flowers with a single glume (flowering glume), sometimes with a second one in the form of an inclosed sac (perigynium) surrounding the ovulary; stem usually solid, often triangular or quadrangular. CYPERACEAE. (158).

8. Flowers epigynous (ovulary inferior). 14.

8. Flowers hypogynous (carpels superior). 9.

8. Carpels distinct, in pits in the large top-shaped receptacle; ovule 1; large aquatic herbs with peltate leaves. NYMPHAEACEAE. (NELUMBONOIDEAE). (406).

8. Flowers perigynous, perianth adherent only to the base or lower half of the ovulary; petals sometimes partly united; some of the— LILIACEAE. (254).

9. Carpels united, usually 3. 11.

9. Carpels united, numerous; ovules numerous; hydrophytes with large flowers. NYMPHAEACEAE. (NYMPHAEOIDEAE). (406).

9. Carpels distinct, numerous or rarely few in a spiral head or a ring; perianth of 3 green sepals and 3 petals, aquatic or marsh herbs usually with milky sap. ALISMACEAE. (53).

9. Carpels distinct, numerous or few; sepals 3, petals 3; ovules few; hydrophytes with peltate floating and some with submerged dissected leaves.
NYMPHAEACEAE. (CABOMBOIDEAE). (406).

9. Carpels distinct, few; perianth none or herbaceous in the carpellate flowers. 10.

10. Submerged aquatics with flat and some floating leaves; bisporangiate or monoecious usually with 4 carpels.
POTAMOGETONACEAE. (40).

10. Submerged aquatics with linear leaves spiny-toothed on the margins; flowers usually dioecious with 1 stamen or 1 carpel; staminate flower with a double membranous sheath.
NAIADACEAE. (40).

11. Perianth not glumaceous or chaffy; flowers not in dense heads. 12.

11. Perianth partly glumaceous or chaff-like; flowers in dense terminal scaly heads or spikes; erect scapose herbs. 13

11. Perianth not glumaceous or chaffy, marsh herbs with rush-like leaves and bisporangiate flowers in spikes or racemes; carpels more or less united until maturity.
SCHEUCHZERIACEAE. (52).

11. Perianth wholly glumaceous of 6 similar divisions; herbs with grass-like leaves and small flowers. JUNCACEAE. (244).

12. Terrestrial herbs; perianth of 3 persistent usually green sepals and 3 ephemeral deliquescent colored petals; endosperm mealy; stamens 6 similar or dissimilar.
COMMELINACEAE. (239).

12. Aquatic herbs: stamens 3 or 6 dissimilar; perianth of 6 petal-like divisions, tubular. PONTEDERIACEAE. (242).

12. Vines or erect plants often prickly with tendrils and dioecious flowers in axilary umbels: fruit a fleshy berry.
SMILACEAE, (275).

12. Terrestrial herbs, rarely woody; seeds with horny endosperm; stamens 6; perianth of similar mostly colored divisions (often partly or completely united) or of green sepals and 3 colored, withering, persistent petals (in one case a 4-parted perianth); plants often bulbous. LILIACEAE. (254).

Subfamilies of the Liliaceae.

a. Fruit mostly a septicidal capsule; plants usually without bulbs; anthers usually extrorse.
MELANTHOIDEAE. (254),

b. Fruit usually a loculicidal capsule; plants mostly bulbous, some with corms or rhizomes; anthers mostly introrse. LILIOIDEAE. (260).

c. Fruit a fleshy berry; erect herbs with rhizomes.
CONVALLARIOIDEAE. (269).

13. Flowers bisporangiate; ovulary 1-locular (unilocular).
XYRIDACEAE. (235).
13. Flowers monoecious or dioecious; ovulary 2-3-locular (bi- or tri-locular). ERIOCAULACEAE. (236).
14. Flowers dioecious, rarely bisporangiate. 15.
14. Flowers bisporangiate; ovules and seeds usually numerous. 16.
15. Aquatic herbs; ovules and seeds several or numerous.
VALLISNERIACEAE. (59).
15. Terrestrial twiners; ovules and seeds 1 or 2 in each cavity of the ovulary. DIOSCOREACEAE. (281).
16. Stamens numerous, aquatic herbs. NYMPHAEACEAE. (406).
16. Stamens 6; flowers usually on a scape from a bulb; erect perennial herbs. AMARYLLIDACEAE. (278).
16. Stamens 3, opposite the outer perianth segments; anthers extrorse, opening lengthwise. IRIDACEAE. (281).
16. Stamens (perfect ones) only 1 or 2, united with the carpels; flowers zygomorphic or unsymmetrical; seeds minute.
ORCHIDACEAE. (289).

17. DICOTYLEDONES.

17. Perianth none or of similar segments or divided into calyx and corolla; corolla when present choripetalous (petals distinct). 18.
17. Perianth composed of calyx and corolla, calyx may be minute or suppressed; corolla sympetalous (petals more or less united). 88.
18. Perianth none; sometimes a minute border, cup, or gland may represent the calyx. 19.
18. Calyx present, sepals distinct or united, green or colored. 22.
18. Calyx and corolla both present, calyx may be minute. 37.
19. Herbs. 20.
19. Trees or shrubs. 21.
20. Herbs with milky sap; flowers much reduced, monoecious, in a cyathium with calyx-like involucre which may be mistaken for a single flower. EUPHORBIACEAE. (585).
20. Marsh herbs with bisporangiate flowers in nodding spikes.
SAURURACEAE. (307).
20. Aquatic or marsh herbs with monoecious flowers, solitary or 2-3 together in the axil of the same leaf, sometimes with 2 membraneous bracts; staminate flower a single stamen, carpellate flower with a single 4-locular ovulary.
CALLITRICHACEAE. (596).
20. Aquatic herbs with minute solitary flowers bursting from a spathe-like involucre; bisporangiate; growing on stones in running water. PODOSTEMACEAE. (472).

21. Both staminate and carpellate flowers in aments; ovulary 1-locular many-seeded; seeds with a tuft of cottony hairs; leaves simple. SALICACEAE. (307).

21. Both staminate and carpellate flowers in aments. ovulary 1-2- locular with 1 ovule in each cavity; carpellate flowers single under each scale of the ament. MYRICACEAE. (320).

21. Flowers in crowded panicles or racemes, plants with opposite leaves. Fraxinus in— OLEACEAE. (723).

21. Flowers imperfectly bisporangiate or monoecious, crowded into catkin-like heads; ovules 1- several in each cavity; stamens 4- many; leaves alternate and simple with deciduous stipules. HAMAMELIDACEAE. (488).

22. Flowers, at least the staminate ones in aments. 23.

22. Flowers not in aments (in ament-like spikes in some Moraceae) but variously clustered, sometimes solitary. 24.

23. Trees with odd-pinnate compound leaves; fruit a nut inclosed in a husk. JUGLANDACEAE. (322).

23. Trees or shrubs with simple leaves; sap not milky; both staminate and carpellate flowers in aments. BETULACEAE. (326).

23. Trees or shrubs; carpellate flowers subtended by an involucre which becomes a bur or cup in fruit; staminate flowers in aments, or capitate. FAGACEAE. (330).

23. Herbs with small greenish flowers: often armed with stinging hairs; fruit an achene. URTICACEAE. (341).

24. Flowers monoecious dioecious or imperfectly bisporangiate. 25.

24. Flowers bisporangiate. 28.

25. Herbs or herbaceous vines. 26.

25. Trees or shrubs. 27.

26. Opposite-leaved herbs or herbaceous vines with dioeceous flowers and watery sap; ovules pendulous. MORACEAE. (339).

26. Herbs with small variously clustered greenish flowers and watery sap; often armed with stinging hairs; ovules erect or ascending, fruit an achene. URTICACEAE. (341).

26. Aquatic or amphibious herbs, the submerged leaves dissected. HALORAGIDACEAE. (664).

26. Perennial herbs with 2-3-ternately compound leaves and 4 or more petal-like or greenish sepals. RANUNCULACEAE. (411).

26. Herbs with jointed stems and sheathing stipules; fruit an achene. POLYGONACEAE. (350).

26. Mealy or scrufy herbs without stipules; flowers imbricated without scarious bracts; fruit a utricle. CHENOPODIACEAE. (368).

26. Herbs with simple mostly entire thin leaves without stipules; flowers mostly imbricated with dry and scarious persistent bracts; fruit a utricle. AMARANTHACEAE. (377).

26. Herbs usually with milky sap; the ovulary free and composed of 3 united carpels, 3-locular. EUPHORBIACEAE. (585).

26. Perennial herbs with perigynous flowers, the calyx tube inclosing the 1-3 carpels; leaves pinnate, the stipules united with the petiole; Sanguisorbia in- ROSACEAE. (490).

27. Trees with alternate leaves, the sap not milky. ULMACEAE. (337).

27. Trees with alternate leaves and milky sap. MORACEAE. (339).

27. Trees or shrubs with opposite leaves; flowers with a bicarpellate 2-locular ovulary. OLEACEAE. (723).

27. Flowers monoecious in naked spherical heads; carpellate heads hanging on long peducles: large trees with alternate leaves and large stipules and with the bark deciduous in broad thin brittle plates. PLATANACEAE. (490).

27. Trees with opposite leaves, a bicarpellate ovulary with 2 ovules in each cavity, and winged 1-seeded fruit. ACERACEAE. (607),

27. Shrubby plants, parasitic on trees, with opposite leaves; carpellate flowers partly epigynous, fruit a berry. LORANTHACEAE. (344).

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28. Flowers partly or completely epigynous. 29.

28. Flowers hypogynous. 30.

29. Shrubs or trees with silvery scurfy leaves; ovulary 1-ovuled, seed erect. ELAEAGNACEAE. (646).

29. Low herbaceous perennials parasitic on roots; flowers in umbel-like clusters; ovulary 1-locular. SANTALACEAE. (345).

29. Ovulary plurilocular, usually 6-locular: not parasitic; 3 minute petals may be present. ARISTOLOCHIACEAE. (347).

29. Perennial herbs with axilary (rarely capitate) flowers; 4 stamens; capsule usually 4-locular, short, cylindrical, many-seeded. ONAGRACEAE. (651).

29. Aquatic or amphibious herbs; the submerged leaves dissected. HALORAGIDACEAE. (664).

29. Herbs with a 5-lobed calyx; stamens as many or twice as many as the sepals; carpels 2, forming a 1-locular ovulary and capsule. SAXIFRAGACEAE. (476).

30. Herbs or twining vines with swollen-jointed stems and sheathing stipules; fruit an achene. POLYGONACEAE. (350).

30. Stipules when present not sheathing. 31.

31. Trees, shrubs, or woody climbers. 32.

31. Herbs. 33.

32. Trees with alternate serrate pinnately-veined leaves with fugacious stipules; ovulary 1-locular 1-2-ovuled.
ULMACEAE. (337).

32. Shrubs or trees with simple leaves, with 4-5 perigynous stamens alternate with the sepals; ovulary 2-5-locular, ovules solitary in each cavity, stigmas 2-5. RHAMNACEAE. (611).

32. Trees with opposite leaves, a bicarpellate ovulary with 2 ovules in each cavity, and winged 1-seeded fruit.
ACERACEAE. (607).

32. Shrubs or trees with 9 or 12 stamens in 3 or 4 cycles; anthers opening by valves; aromatic. LAURACEAE. (435).

27 ~~32.~~ Woody climbers with palmate or peltate, alternate leaves and no stipules; flowers imperfectly dioecious; fruit a 1-seeded drupe. MENISPERMACEAE. (434).

32. Shrubs with entire alternate leaves without stipules; ovulary 1-locular with 1 ovule; calyx 4-5-lobed or entire; stamens united with the calyx, usually twice as many as its lobes.
THYMELEACEAE. (645).

33. Gynoecium of several to many distinct carpels; androecium of numerous stamens fruit either dry pods, seed-like achenes, or berries. RANUNCULACEAE. (411).

33. Carpels 5, united to the middle; seeds small and numerous. Penthorum in— CRASSULACEAE. (475).

33. Carpels of the gynoecium 1 or several always united. 34.

34. Leaves opposite or whorled. 35.

34. Leaves alternate, 36.

35. Herbs with a more or less tubular calyx like a sympetalous colored corolla; stems with tumid joints; fruit a utricle inclosed in the persistent base of the calyx.
NYCTAGINACEAE. (382).

35. Herbs with opposite or whorled leaves without stipules; capsule 2-several-locular. AIZOACEAE. (383).

35. Herbs with opposite entire leaves, usually with swollen joints; ovulary 1-locular forming a capsule.
CARYOPHYLLACEAE. (387).

35. Small succulent perennial leafy herb with entire obtuse fleshy leaves; flowers axilary, pink or white; calyx 5-parted, stamens 5; fruit a 1-locular capsule composed of 5 carpels. Glaux in PRIMULACEAE. (713).

35. Submerged hydrophytes; leaves whorled and dissected.
CERATOPHYLLACEAE. (408).

35. Chiefly mealy herbs with greenish sepals; no stipules or scarious bracts; fruit a utricle. CHENOPODIACEAE. (368).
35. Stipules none but flowers with scarious bracts; weedy herbs; fruit a utricle. AMARANTHACEAE. (377).
35. Herbs with opposite, alternate or verticillate leaves and milky sap; ovulary 3-locular with 1 or 2 ovules in each cavity; styles 3. EUPHORBIACEAE. (585).
35. Herbs with succulent entire leaves; ovulary compound, 1-locular with a central placenta. PORTULACACEAE. (384).
36. Herbs with fleshly berries; carpels 10 forming a 10-locular, 10-seeded ovulary. PHYTOLACCACEAE. (381).
36. Herbs with finely dissected leaves, petal-like sepals, and usually with a large number of small glandular petals. RANUNCULACEAE. (411).
36. Calyx caducous, sepals 2 (rarely 3 or 4); herbs with alternate leaves without stipules and with a milky or colored sap. PAPAVERACEAE. (437).
36. Chiefly mealy herbs with green or greenish sepals, no stipules or scarious bracts; fruit a utricle. CHENOPODIACEAE. (368).
36. Stipules none but flowers with scarious bracts; weedy herbs; fruit a utricle. AMARANTHACEAE. (377).
36. Herbs with opposite, alternate, or verticillate leaves and milky sap; ovulary 3-locular with 1 or 2 ovules in each cavity; styles 3. EUPHORBIACEAE. (585).
36. Herbs with succulent entire leaves; ovulary compound, 1-locular with a central placenta. PORTULACACEAE. (384).

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37. Flowers hypogynous or perigynous; ovulary free from the calyx or adherent to the perigynous disc. 38.
37. Flowers epigynous; calyx adherent to the ovulary. 79.
38. Stamens numerous, at least more than 10 and more than twice the petals. 39.
38. Stamens of the same number as the petals and opposite them. 46,
38. Stamens not more than twice as many as the petals, when of just the number as the petals then alternate with them. 50.
38. Stamens 5–60, often indefinite in position: fleshy herbs with succulent entire leaves; carpels united. PORTULACACEAE. (384).
39. Carpels more than 1, distinct, not inclosed in the receptacle (perigynous disc). 40.
39. Carpels 1 or more, united, but styles and stigmas may be several. 41.
39. Carpels numerous spirally arranged and cohering over each

other, forming an aggregate cone-like fruit; trees; sepals and petals in threes. MAGNOLIACEAE. (409).

39. Carpels several, distinct or united; hydrophytes with large leaves, peltate or with a basal sinus; submerged leaves may be dissected (Monocotyledones). NYMPHAEACEAE. (406).

39. Carpels numerous, separate, concealed in a hollow receptacle (perigynous disc); leaves alternate with stipules. ROSACEAE (ROSOIDEAE). (490).

39. Carpels 3-6, united below the middle of the ovularies; sepals and petals 4-8. irregular; herbs with alternate leaves and glandular stipules. RESEDACEAE. (469).

39. Carpels several, their ovularies cohering in a ring around an axis; stamens many, their filaments united into a tube; herbs or shrubs with alternate stipulate leaves, palmately-veined. MALVACEAE. (617).

40. Stamens separate inserted on the perigynous disc with the calyx; leaves alternate with stipules. ROSACEAE (ROSOIDEAE). (490).

40. Stamens united into a tube with the base of the petals; herbs or shrubs with alternate stipulate leaves, palmately-veined. MALVACEAE. (617).

40. Stamens inserted on the receptacle, filaments much shorter than the anthers; perianth trimerous; carpels 5, more or less; entire alternate leaves without stipules. ANONACEAE. (410).

40. Stamens inserted on the receptacle, filaments longer than the anthers; dioecious twiners with alternate leaves. MENISPERMACEAE. (434).

40. Stamens inserted on the receptacle, filaments longer than the anthers; flowers bisporangiate; herbs; or climbers with oppoleaves. RANUNCULACEAE. (411).

41. Ovulary simple, 1-locular with 1 parietal many-ovuled placenta (1 carpel). 42.

41. Ovulary compound, 1-locular with 2 or more parietal placentae (2 or more carpels). 43.

41. Ovulary simple, 1-locular. 2 ovuled; or plurilocular composed of 5 united carpels with a perigynous disc; trees or shrubs, leaves alternate with deciduous stipules. ROSACEAE. (490).

    a. Ovulary composed of 1-5 wholly or partly united carpels; fruit a more or less fleshy pome. POMOIDEAE. (514).

    b. Ovulary 1-locular, 2-ovuled; fruit a drupe with 1 seed. DRUPOIDEAE. (523).

41. Ovulary compound, 1-locular, with a central placenta; herbs with succulent leaves. PORTULACACEAE. (384).

41. Ovulary 1-7-locular composed of 1-7 carpels; styles as many as the carpels; herbs or shrubs with opposite rarely verticillate leaves, punctate or black-dotted without stipules, HYPERICACEAE. (625).

41. Ovulary compound plurilocular; plants not as above. 44.

42. Leaves 2-3-ternately compound or dissected. RANUNCULACEAE. (411).

42. Leaves peltate, simply lobed; herbs with underground rhizomes; Podophyllum in— BERBERIDACEAE. (432).

43. Calyx caducous; sap milky or colored; sepals 2 (rarely 3 or 4); herbs usually with alternate leaves and no stipules. PAPAVERACEAE. (437).

43. Calyx deciduous of 4 sepals, capsule of 2 carpels 2-valved; sap not milky; herbs with alternate leaves mostly palmately compound. CAPPARIDACEAE. (467).

43. Calyx persistent of 3 or 5 sepals; low shrubs or herbs; leaves simple mostly entire, the lower usually opposite, the upper alternate. CISTACEAE. (630).

44. Calyx valvate in the bud. 45.

44. Calyx imbricated in the bud; hydrophytes; carpels numerous (Monocotyledones). NYMPHAEACEAE. (406).

44. Calyx imbricated in the bud, persistent; ovulary 3-5-locular; insectivorous marsh herbs with hollow pipe-like leaves. SARRACENIACEAE. (470).

45. Calyx of 5 sepals and usually a large number of petals which may be small and glandular; herbs with alternate finely-dissected leaves. RANUNCULACEAE. (411).

45. Calyx persistent, stamens united by their filaments into a tube; herbs or shrubs with alternate palmately-veined leaves with stipules. MALVACEAE. (617).

45. Sepals and petals usually 5, the lower half of the calyx united with the ovulary; shrubs or herbs with simple opposite leaves and no stipules. HYDRANGEACEAE. (484).

45. Calyx deciduous; trees with alternate leaves and with mucilaginous sap. TILIACEAE. (616).

45. Herbs with opposite, alternate, or verticillate leaves; ovulary 3-locular with 1 or 2 ovules in each cavity; styles 3. EUPHORBIACEAE. (585).

46. Carpels 1 or several united. 47.

46. Carpels 3-6, distinct; flowers dioecious; vines with palmate or peltate alternate leaves without stipules. MENISPERMACEAE. (434).

47. Ovulary 1-locular; anthers opening by uplifted valves; shrubs or herbs; fruit a berry or pod. BERBERIDACEAE. (432).

47. Ovulary 1-locular; anthers not opening by uplifted valves. 48.

47. Ovulary 2-5-locular. 49.

48. Style and stigma 1; ovules more than 1; herbs with simple leaves. PRIMULACEAE. (713).

48. Style 1, stigmas 3, sepals 2, ovules several; herbs with succulent leaves. PORTULACACEAE. (384).

48. Styles 2-3-forked; flowers monoecious; slender low annual herbs; Crotonopsis in— EUPHORBIACEAE. (585).

49. Calyx-lobes minute or obsolete, petals valvate, caducous; fruit a berry; woody vines climbing by tendrils. VITACEAE. (613).

49. Calyx 4-5-cleft, valvate in the bud; petals involute; fruit a drupe or capsule; shrubs, small trees, or vines with simple leaves. RHAMNACEAE. (411).

—50—

50. Carpels 2-5, somewhat united at the base, distinct above. 55.

50. Ovulary only 1, carpels 1 to many. united. 57.

50. Carpels 2 or more, distinct. 51.

50. Carpels 5 united with a common style; capsule at length splitting into its 5 carpels; herbs with stipulate leaves. GERANIACEAE. (573).

50. Carpels 5 united, the 5 styles separate; herbs with trifoliate leaves. OXALIDACEAE. (575).

50. Carpels 3 (sometimes 2) with a common style; ovulary deeply lobed; annual herbs with alternate pinnately divided leaves without stipules. LIMNANTHACEAE. (599).

51. Stamens distinct, on the receptacle, not united with the calyx. 52.

51. Stamens distinct united with the calyx or on a perigynous disc. 54.

51. Stamens united with each other and with a large and thick stigma common to the 2 ovularies; plants with milky sap. ASCLEPIADACEAE. (740).

52. Leaves not punctate with pellucid dots. 53.

52. Leaves punctate with pellucid dots, simple or compound, alternate or opposite, without stipules. RUTACEAE. (581).

53. Trees with pinnate leaves. SIMARUBIACEAE. (582).

53. Herbs, not fleshy; petioles dilated at the base without stipules. RANUNCULACEAE. (411).

53. Herbs with thick fleshy leaves without stipules. CRASSULACEAE. (473).

54. Just twice as many stamens as carpels; flowers actinomor-

phic; herbs, leaves fleshy without stipules. CRASSULACEAE. (473).

54. Carpels usually 2. petals 4 or 5, stamens as many or twice as many as the petals; herbs with the leaves usually basal and forming rosettes. SAXIFRAGACEAE. (476).

54. Stamens not just the number nor twice the number of the carpels; alternate leaves with stipules. ROSACEAE (ROSOIDEAE). (490).

55. Leaves punctate with pellucid dots; no stipules. RUTACEAE. (581).

55. Leaves not punctate with pellucid dots. 56.

56. Shrubs or trees with opposite digitate leaves, leaflets serrate. HIPPOCASTANACEAE. (608).

56. Shrubs or trees with alternate simple leaves and deciduous stipules. HAMAMELIDACEAE. (488).

56. Terrestrial herbs, the carpels fewer than the petals. SAXIFRAGACEAE. (476).

56. Terrestrial or swamp herbs, the carpels equal to the petals in number. Penthorum in— CRASSULACEAE. (473-475).

57. Carpel 1, ovulary with 1 parietal placenta; leaves alternate with stipules, usually compound. LEGUMINOSAE. (527).

Subfamilies.

a. Fruit a legume; leaves 2–3-pinnate; calyx 3–6-lobed, mostly valvate; corolla of as many distinct or united petals also valvate. MIMOSOIDEAE. (527).

b. Fruit a legume; upper petal inclosed by the lateral ones in the bud; leaves compound mostly with stipules. CAESALPINIOIDEAE. (528).

c. Fruit spiny, leaves simple without stipules. KRAMERIOIDEAE. (531).

d. Fruit a legume or loment, upper petal inclosing the lateral ones in the bud; leaves compound (sometimes with 1 leaflet) with stipules. PAPILIONOIDEAE. (532).

57. Carpels more than 1 as shown by the compound ovulary, cavities, placentae, styles, or stigmas. 58.

58. Ovulary 1-locular. 59.

58. Ovulary 2-locular to plurilocular. 64.

59. Corolla regular or nearly so. 60.

59. Corolla irregular, zygomorphic; petals and stamens 5; herbs with alternate stipulate leaves. VIOLACEAE. (633).

59. Corolla irregular; petals 4, stamens 6, sepals 2 minute; herbs usually with alternate leaves without stipules. PAPAVERACEAE. (437).

60. Ovules solitary, stigmas 3; shrubs or trees with resinous or milky sap and alternate leaves without stipules. ANACARDIACEAE. (599).

60. Ovules solitary or few; herbs with alternate leaves without stipules, sap not milky. CRUCIFERAE. (443).

60. Ovules 1 or usually more, in the center or bottom of the cavity. 61.

60. Ovules several or many, on 2 or more parietal placentae. 62.

61. Petals not united with the calyx; herbs with opposite entire leaves; stems usually swollen at the joints. CARYOPHYLLACEAE. (387).

61. Petals united with the bell-shaped or tubular calyx; herbs mostly with opposite entire leaves and no stipules. LYTHRACEAE. (648).

62. Leaves covered with reddish gland-tipped bristles, circinate in the bud; ovulary 1-locular; insectivorous herbs. DROCERACEAE. (470).

62. Leaves punctate with pellucid and dark dots; herbs or shrubs with opposite entire leaves and no stipules. HYPERICACEAE. (624).

62. Leaves not punctate nor covered with glandular bristles. 63.

63. Sepals 5, petals 3 or 5, convolute in the bud in the opposite direction from the calyx; low shrubs or herbs with simple leaves, the lower usually opposite the upper alternate; the stamens and petals free from the calyx. CISTACEAE. (630).

63. Sepals and petals 4; stamens 6; herbs with alternate leaves without stipules; some— CRUCIFERAE. (443).

63. Sepals and petals 5; ovulary and stamens raised on a stalk; herbs or woody plants climbing by tendrils PASSIFLORACEAE. (641).

63. Sepals and petals 5; ovulary sessile, usually consisting of 2 carpels distinct, or united then 2-locular; herbs with alternate or opposite leaves usually without stipules; stamens and petals usually somewhat united with the calyx. SAXIFRAGACEAE. (476).

63. Sepals and petals 5, fertile stamens 5; ovulary 1-locular with 4 parietal placentae; style 1, stigmas 4; bog herbs with a basal rosette of leaves. PARNASSIACEAE. (475).

63. Sepals 4 or 5, petals 4 or 5, united with the calyx; stamens 4 or 5 united with the perianth; ovulary 1-locular, styles 2, distinct or united; fruit a pulpy berry; shrubs. GROSSULARIACEAE. (486).

64. Flowers irregular. 65.

64. Flowers regular or nearly so. 68.

65. Anthers opening at the top; ovulary 2-locular, 2-ovuled; herbs or somewhat shrubby plants with simple entire leaves without stipules. POLYGALACEAE. (582).

65. Anthers opening lengthwise. 66.

66. Stamens 11 or 12 and petals 6 united with the tubular inflated or gibbous calyx; herbs with simple entire leaves. LYTHRACEAE. (648).

66. Stamens 5-8 or 10; petals hypogynous or nearly so. 67.

67. Ovulary 3-locular; trees with opposite digitate leaves. HIPPOCASTANACEAE. (608).

67. Ovulary 5-locular; tender succulent herbs with simple leaves without stipules. BALSAMACEAE. (610).

68. Stamens neither just as many nor twice as many as the petals. 69.

68. Stamens just as many or twice as many as the petals. 70.

69. Stamens triadelphous, petals 5; herbs or shrubs with opposite entire punctate leaves and no stipules. HYPERICACEAE. (624).

69. Stamens numerous not triadelphous; shrubs or trees with simple opposite leaves and no stipules. HYDRANGEACEAE. (484).

69. Stamens 6 tetradynamous (rarely 2 or 4); petals 4; herbs with alternate leaves without stipules. CRUCIFERAE. (443).

69. Stamens distinct and fewer than the 4 petals; trees or shrubs with opposite pinnate or simple leaves. OLEACEAE. (723).

70. Ovules and seeds 1 or 2 in each cavity. 71.

70. Ovules and seeds 3-5 in each cavity; annual more or less prostrate herbs with pinnate leaves of 4-8 pairs of leaflets. ZYGOPHYLLACEAE. (580).

70. Ovules and usually seeds several or many in each cavity. 75.

71. Herbs usually with milky sap; flowers monoecious or dioecious. EUPHORBIACEAE. (585).

71. Herbs without milky sap; flowers bisporangiate and actinomorphic. 72.

71. Shrubs, trees, woody climbers, or herbaceous vines. 73.

72. Cavities of the ovulary as many as the sepals, etc.; leaves with stipules. GERANIACEAE. (573).

72. Cavities of the ovulary twice as many as the styles, sepals, etc.; leaves without stipules but often with glands in their place. LINACEAE. (578).

73. Leaves pinnately veined, simple, not punctate. 74.

73. Leaves pinnately compound, alternate; climbing herbaceous vines with fruit an inflated 3-lobed capsule; or trees with a globose or lobed berry. SAPINDACEAE. (609).

73. Leaves palmately veined or pinnately compound; fruit winged; trees or shrubs with opposite leaves and no stipules. ACERACEAE. (607).

73. Leaves 3-foliate, pellucid-punctate, without stipules. Ptelea in— RUTACEAE. (581).

74. Calyx minute, fruit a berry-like drupe; trees or shrubs with simple mostly alternate leaves. ILICACEAE. (602).

74. Calyx not minute; pod colored, dehiscent; seeds inclosed in a pulpy aril; shrubs or woody climbers with alternate or opposite leaves and with minute fugaceous stipules. CELESTRACEAE. (605).

75. Stipules none when the leaves are opposite. 76.

75. Stipules between the opposite and simple leaves; small marsh annuals. ELATINACEAE. (629).

75. Stipules between the opposite and pinnately compound leaves, caducous; shrubs or small trees. STAPHYLEACEAE. (606).

76. Stamens 10, slightly united at the base; leaflets 3, inversely heart-shaped; herbs with sour sap. OXALIDACEAE. (575).

76. Stamens distinct, free from the calyx. 77.

76. Stamens distinct, united with the calyx. 78.

77. Style 1 undivided; white or yellowish herbs without chlorophyll. MONOTROPACEAE. (695).

77. Style 1, stigma 5-lobed; mostly evergreen perennials. PYROLACEAE. (692).

77. Styles 2–5, distinct; herbs with opposite entire leaves, the stems usually with swollen joints. CARYOPHYLLACEAE. (387).

78. Shrubs, trees, or woody vines; ovulary 2–plurilocular; fruit a capsule. HYDRANGEACEAE. (484).

78. Sepals 4 or 5; petals 4 or 5 united with the calyx; stamens 4 or 5 united with the perianth; ovulary 1–locular, styles 2, distinct or united; fruit a pulpy berry; shrubs. GROSSULARIACEAE. (486).

78. Style 1, pod in the calyx, 1–6–locular; herbs usually with opposite leaves. LYTHRACEAE. (648).

—79—

79. Ovules and seeds more than 1 in each cavity of the ovulary. 80.

79. Ovules and seeds only 1 in each cavity of the ovulary. 85.

80. Ovulary 1–locular. 81.

80. Ovulary 2–locular to plurilocular. 82.

81. Fleshy spiny plants usually with jointed stems; leaves small or none; petals and sepals numerous. CACTACEAE. (643).

81. Erect herbs with a rough or stinging pubescence; no stipules;

2 or 3 parietal placentae; stamens numerous. LOASACEAE. (641).

81. Smooth herbs with succulent entire leaves; styles 3–8, united below or distinct. PORTULACACEAE. (384).

81. Herbs with opposite or alternate leaves; 2 or 3 parietal placentae; stamens as many or twice as many as the petals. SAXIFRAGACEAE. (476).

81. Shrubs, trees, or woody vines; ovulary 2–plurilocular; fruit a capsule. HYDRANGEACEAE. (484).

81. Shrubs; sepals 4 or 5, petals 4 or 5 stamens 4 or 5 united with the perianth; ovulary 1–locular, styles 2. distinct or united; fruit a pulpy berry. GROSSULARIACEAE. (486).

82. Anthers not opening by pores. 83.

82. Anthers opening by pores at the apex; style 1; ours herbs with opposite 3–5–nerved leaves. MELASTOMACEAE. (650).

83. Stamens united with the calyx. 84.

83. Stamens on a flat disc which covers the ovulary; shrubs or woody climbers with simple leaves and minute fugacious stipules. CELASTRACEAE. (605).

83. Stamens on the ovulary more or less united with the style; woody twiners or low herbs with a 6–locular ovulary. ARISTOLOCHIACEAE. (347).

84. Stamens 4 or 8, rarely 5, style 1; herbs with opposite or alternate leaves, stipules none or glandular. ONAGRACEAE. (651).

84. Stamens 5 or 10, styles 2 or 3 distinct; herbs usually without stipules. SAXIFRAGACEAE. (476).

84. Stamens 5, 10 or many; leaves alternate with stipules. ROSACEAE (POMOIDEAE). (514).

7

85. Herbs. 86.

85. Shrubs or trees. 87.

86. Stamens 2 or 8, style 1, stigma 2-4-lobed; plants with opposite or alternate leaves; stipules none or glandular; calyx tube almost entirely united with the ovulary. ONAGRACEAE. (651).

86. Stamens 4 or 8, styles or sessile stigmas 4; hydrophytes with dissected submerged leaves (in Hippuris whorled narrow leaves). HALORAGIDACEAE. (664).

86. Stamens 2–14; plants with mostly entire leaves without stipules; calyx tube merely inclosing the ovulary, but free from it except at the base; fruit a capsule. LYTHRACEAE. (648).

86. Stamens 5, fruit a fleshy berry or drupe; flowers umbellate, capitate, or panicled. ARALIACEAE. (667).

86. Stamens 5, fruit dry, styles 2; flowers in umbels or rarely in heads; leaves alternate, usually compound. UMBELLIFERAE. (669).

87. Stamens 4 or 5, style and stigma 1; leaves simple; fruit a 1-2-seeded drupe. CORNACEAE. (689).

87. Stamens 5, styles usually 2-5; fruit a fleshy berry or drupe; leaves compound. ARALIACEAE. (667).

87. Stamens 2 or 8, style 1, stigma 2-4-lobed; plants with opposite or alternate leaves; stipules none or glandular. ONAGRACEAE. (651).

87. Stamens 5, 10, or many; leaves alternate with stipules. ROSACEAE (POMOIDEAE). (514).

87. Perfect stamens 4, styles 2; plants with alternate simple leaves and deciduous stipules. HAMAMELIDACEAE. (488).

—88—

88. Flowers hypogynous (ovulary superior). 89.

88. Flowers epigynous (ovulary inferior). 106.

89. Stamens free from the corolla (or only slightly united at the base) as many as the petals (flowers tetracyclic) and alternate with them, or twice as many (pentacyclic), or more. 90.

89. Stamens united with the corolla. as many as the petals and opposite them or twice as many or more. 91.

89. Stamens united with the corolla or only united at the base, as many as the petals or fewer and alternate with them. 93.

90. Fruit a capsule or rarely drupaceous; corolla choripetalous; mostly low evergreen perennials. PIROLACEAE. (692).

90. Corolla choripetalous or sympetalous; herbs without green leaves. MONOTROPACEAE. (695).

90. Ovulary 2-5-locular; shrubs often with evergreen leaves; fruit a capsule, berry or drupe. ERICACEAE. (696).

90. Calyx tube adherent to the ovulary which forms a many-seeded berry or drupe in fruit. VACCINIACEAE. (707).

90. Calyx free, styles 2, distinct with united stigma; plants with milky sap and entire leaves, usually opposite or whorled; pollen grains united into waxy masses. ASCLEPIADACEAE. (740).

90. Choripetalous plants in which the petals are sometimes partly or completely united.

- a. Ovulary 1-locular (1 carpel) with 1 parietal placenta. LEGUMINOSAE. (527).
- b. Ovulary 1-locular with 2 parietal placentae (2 carpels); herbs. PAPAVERACEAE. (437).
- c. Ovulary 2-locular with a single ovule in each cavity; herbs. POLYGALACEAE. (582).
- d. Ovulary 5-locular, 5 styles (5 carpels); stamens 5 long and 5 short, somewhat united below; herbs. OXALIDACEAE. (575).
- e. Ovulary 4-8-locular, with a solitary seed in each

cavity; fruit a berry-like drupe; trees or shrubs. ILICACEAE. (602).

f. Ovulary 3-locular; herbs with milky sap, EUPHORBIACEAE. (585).

91. Shrubs or trees. 92.

91. Herbs, style 1, fruit a capsule. PRIMULACEAE. (713).

91. Succulent herbs; carpels as many as the petals, nearly always free, forming many-seeded pods. CRASSULACEAE. (473).

92. Stamens as many as the lobes of the corolla; leaves entire, simple and alternate. . SAPOTACEAE. (720).

92. Stamens twice as many as the lobes of the corolla or more; styles 2-8; plants mostly monoecious or dioecious; leaves alternate and entire. EBENACEAE. (721).

93. Corolla not scarious, often nerved. 94.

93. Corolla scarious, nerveless; herbs with small flowers in spikes or heads. PLANTAGINACEAE. (856).

94. Carpels 2, distinct below. 95.

94. Carpels united forming a compound ovulary. 96.

95. Styles and stigmas united, sap milky, stamens distinct; pollen of simple grains; leaves entire without stipules. APOCYNACEAE. (737).

95. Styles distinct, stigmas united; stamens mostly united; pollen grains united into waxy masses; sap milky, leaves entire usually opposite or whorled. ASCLEPIADACEAE. (740).

96. Corolla regular. 97.

96. Corolla irregular, more or less 2-lipped. 100.

97. Ovulary not 4-lobed and the carpels or parts of the carpels not separating as nutlets at maturity. 98.

97. Ovulary slightly 4-lobed. the cavities many-seeded; fruit a capsule; stamens 5; some— SOLANACEAE. (808).

97. Ovulary not deeply lobed, 2-4-locular, the ovulary separating into 1-seeded nutlets; plants not aromatic, leaves opposite. VERBENACEAE. (776).

97. Ovulary deeply 4-lobed (except in Heliotropium) around the style. separating as 1-seeded nutlets; chiefly rough herbs (sometimes smooth) with alternate leaves. BORAGINACEAE. (766).

97. Ovulary 4-lobed around the style; the lobes ripening into a 1-seeded nutlets; herbs with square stems and opposite aromatic leaves. LABIATAE. (779).

98. Stamens as many as the lobes of the corolla. 99.

98. Stamens fewer (usually 2) than the lobes of the corolla (or corolla none); ovulary 2-locular; trees or shrubs with opposite leaves. OLEACEAE. (723).

99. Ovulary 2-locular, sometimes 3-4-locular; styles 1-3, more or less united; mostly twining vines with normal green leaves. CONVOLVULACEAE. (749).

99. Ovulary 3-locular, stigmas 3 linear; herbs not twining. POLEMONIACEAE. (756).

99. Ovulary 2-locular, styles 2; white or yellowish stem-parasites with leaves reduced to minute bracts. CUSCUTACEAE. (754).

99. Ovulary 2-locular (sometimes 3-5-locular) with axile placentae, carpels several- to many-seeded; fruit a berry or capsule; fertile stamens 5, sometimes 4; leaves alternate. SOLANACEAE. (808.).

99. Ovulary 1-locular; style 1, 2-lobed or 2-parted; 2 parietal placentae, 4-many-ovuled; herbs not twining, usually hairy. HYDROPHYLLACEAE. (762).

99. Ovulary 1-locular, 2 parietal placentae, forming a many-seeded capsule; smooth herbs with sessile opposite leaves, rarely verticillate or alternate. GENTIANACEAE. (728).

99. Ovulary 1-locular with 2 placentae; perennial aquatic or marsh herbs with basal or alternate leaves and clustered flowers. MENYANTHACEAE. (736).

100. Ripe ovulary 1-4-seeded; 101.

100. Ripe ovulary several-to many-seeded. 102.

101. Ovulary not lobed, 2-4-locular, the style apical; ovulary separating into 1-seeded nutlets; leaves opposite. VERBENACEAE. (776).

101. Ovulary 4-lobed around the style, the lobes separating into 1-seeded nutlets; herbs usually with square stems and opposite aromatic leaves. LABIATAE. (779.)

101. Ovulary 2-locular; fertile stamens 2 or 4; seeds few, supported on hooked or curved projections of the placentae; herbs with opposite simple leaves. ACANTHACEAE. (853).

101. Ovulary 1-locular with 1 erect ovule and seed; herbs with spicate flowers and reflexed fruit. PHRYMACEAE. (855).

102. Placentae axile. 103.

102. Placentae parietal. 104.

103. Ovulary 2-locular (sometimes 3-5-locular); flowers regular or nearly so; fruit a berry or capsule; fertile stamens 5, sometimes 4; leaves alternate. SOLANACEAE. (808).

103. Ovulary 2-locular flowers irregular; fertile stamens 2 or 4; (5 in Verbascum); fruit a capsule; seeds usually numerous, not on hooks; leaves opposite or alternate. SCROPHULARIACEAE. (818).

103. Ovulary 2-locular; fertile stamens 4 or 2; seeds few, support-

ed on hooked or curved projections of the placentae; herbs with opposite simple leaves. ACANTHACEAE. (853).

103. Ovulary 1-locular; marsh or aquatic herbs with flowers on a scape; stamens 2; leaves capillary, dissected, bearing little bladders. LENTIBULARIACEAE. (845).

104. Parasitic herbs, on the roots of other plants; leaves reduced to bracts, not green; ovulary 1-locular. OROBANCHACEAE. (848).

104. Trees, vines shrubs, or herbs with normal leaves. 105.

105. Trees. shrubs, or woody vines; capsule 2-locular, seeds winged. BIGNONIACEAE. (850).

105. Herbs with opposite leaves; capsule 1-locular, seeds wingless. MARTYNIACEAE. (852).

106. Anthers distinct. 107.

106. Anthers united. 109.

107. Stamens as many as the lobes of the corolla and alternate with them, or twice as many; ovulary compound with 1 or more ovules in each cavity. 108.

107. Stamens 1-3, fewer than the lobes of the corolla; ovulary 1-locular with 1 ovule or 3-locular with 2 empty cavities, herbs with opposite leaves and no stipules. VALERIANACEAE. (878).

107. Stamens 2-4; ovulary 1-locular with 1 ovule: herbs with opposite or whorled leaves without stipules; flowers in dense involucrate heads. DIPSACACEAE. (880).

108. Stamens 5, ovualry 1-locular; flowers in involucrate heads; herbs without stipules; some— COMPOSITAE. (889).

108. Stamens as many as the lobes of the corolla; leaves opposite with stipules or in whorls without apparent stipules; plants usually blackening in drying. RUBIACEAE. (860).

108. Stamens as many as the lobes of the corolla; leaves opposite, usually without stipules, not blackening in drying. CAPRIFOLIACEAE. (869).

108. Stamens 1-10, free from the corolla, the anthers ending in 2 tubes which open at the tips; ovulary when ripe forming a many-seeded berry or drupe. VACCINIACEAE. (707).

108. Herbs with alternate leaves and milky sap; flowers not in involucrate heads; stamens free from the corolla. CAMPANULACEAE. (883).

109. Flowers not in involucrate heads; herbs or herbaceous vines, often with milky sap. 110.

109. Flowers in involucrate heads, usually herbs without stipules; some with milky sap. COMPOSITAE. (889).

Subfamilies.

a. Flowers all tubular (carpellate ones often with no corolla); stamens distinct or nearly so. AMBROSIOIDEAE. (908).

b. Flowers all tubular or the outer expanded into rays (sometimes all flowers ligulate); stamens united by their anthers into a tube around the style (distinct in Kuhnia); sap very rarely milky. HELIANTHOIDEAE. (913).

c. Flowers all ligulate; sap milky. CICHORIOIDEAE. (889).

110. Vines; flowers monoecious or dioecious; leaves alternate, palmately lobed or veined. CUCURBITACEAE. (881).

110. Herbs with milky sap and alternate leaves, not vines; flowers bisporangiate. CAMPANULACEAE. (883).

Glossary of Common Botanical Terms.

Achene.	A one-seeded dry indehiscent fruit with a tightly fitting pericarp around the seed.
Actinomorphic.	Radially symmetrical; a flower or organ which can be cut into similar equal halves by two or more planes.
Acuminate.	Tapering gradually to the apex.
Acute.	Sharp pointed.
Ament.	A slender usually flexible spike of flowers, as in the willows.
Amphibious.	Growing at times in the water at others on the land.
Amphitropous.	A partly inverted ovule.
Anatropous.	An inverted ovule with the micropyle near the hilum.
Androecium.	The whole set of stamens in a flower.
Anther.	The spore-bearing part of a stamen; the part which finally contains the pollen sacs.
Anthesis.	The period of flowering.
Apetalous.	Without petals.
Appressed.	Lying close against another organ.
Aquatic.	Living in the water.
Aril.	A fleshy organ around the hilum.
Awn.	A slender bristle-like organ.
Axil.	The point of a stem just above the base of the leaf.
Axile.	In the axis of an organ.
Berry.	A fruit with a fleshy or pulpy pericarp.
Bilocular (2-locular).	Having two cavities.
Bisporangiate.	Having both microsporangia and megasporangia; having both stamens and carpels.
Blade.	The expanded part of a leaf.
Bract.	A small, rudimentary, or imperfectly developed leaf.
Bulb.	A bud with fleshy bracts or scales, usually subterranean.
Caducous.	Falling away very soon after development.
Caespitose.	Growing in tufts.
Calyx.	The outer set of sterile floral leaves; the whole set of sepals.
Campylotropous.	An ovule curved like a horseshoe.
Canescent.	With gray or hoary fine pubescence.
Capitate.	Arranged in a head.
Capsule.	A dry fruit of two or more carpels usually dehiscent by valves or teeth.
Carpel.	The megasporophyll of a seed plant; the modified leaf or stem bearing the ovules.

Carpellate. Having only carpels, or carpellate flowers.

Catkin. Same as ament.

Cauline. Pertaining to the stem.

Chaff. Dry thin scales.

Chlorophyll. The green coloring matter of plants.

Choripetalous, Having the petals separate or free.

Cleistogamous. Flowers which do not open and are pollinated from their own anthers.

Coalescence. State of being united or grown together.

Cone. A primitive flower as the carpellate cone of the pine.

Convolute. Rolled around or rolled up longitudinally.

Cordate. Heart-shaped.

Corm. A swollen, fleshy, upright, geophilous stem.

Corolla. The inner set of sterile, usually colored, floral leaves; the whole set of petals.

Cotyledon. A leaf-like organ of the embryo in the seed.

Crenate. With rounded teeth.

Cuneate. Wedge-shaped.

Cyathium. An inflorescence, as in the spurges.

Cyme. An inflorescence of the determinate type, the central flower developing first.

Deciduous. Falling away at the end of the growing period.

Decompound. More than once compound.

Dehiscence. The opening of an ovulary, sporangium, or pollen sac for the discharge of the contents.

Deliquescent. Dissolving or liquefying.

Dentate. With outwardly projecting teeth.

Diadelphous. Having the stamens united into two sets.

Dichotomous. Two-forked.

Didymous. Twin-like.

Digitate. Diverging like the spread fingers.

Dioecious. Having the microsporangiate or staminate flowers and the megosporangiate or carpellate flowers on separate plants.

Dissected. Divided into many segments.

Drupe. A simple usually indehiscent fruit with fleshy exocarp and bony endocarp.

Emarginate. With a notched apex.

Embryo. An incipient plant in the seed.

Embryo sac. The female gametophyte, contained in the ovule of seed plants.

Endocarp. The inner layer of the pericarp.

Endosperm. The nourishing tissue developed around the embryo in the female gametophyte of the angiosperms.

Ephemeral.	Continuing for only a day or less.
Epigynous.	Having the calyx, corolla, and androecium above the ovulary.
Evanescent.	Disappearing early.
Exocarp.	The outer layer of the pericarp.
Extrorse.	Facing outwards.
Fertile.	Bearing spores or seeds.
Fertilization.	The conjugation of the male and female gametes.
Filament.	The stalk of an anther.
Flower.	The modified spore-bearing branch of the seed plants.
Flowering glume.	The outer of the two glumes inclosing a grass flower.
Fruit.	The ripe ovulary with the seeds and whatever parts are consoildated with it.
Fugaceous.	Falling soon after development.
Funiculus.	The little stalk by which the ovule or seed is attached to the placenta.
Gamete.	A sexual cell.
Gametophyte.	The sexual generation of plants.
Geophilous.	Earth-loving; growing partly or completely subterranean.
Gibbous.	Enlarged or swollen on one side.
Gland.	A group of secreting cells.
Glomerate.	In a close or compact cluster.
Glumaceous.	Resembling or having glumes.
Glume.	The scaly bracts of the flowers and spikelets of grasses and sedges.
Gynoecium.	The whole set of carpels in a flower.
Habit.	General aspect.
Habitat.	The place where a plant grows.
Hastate.	Arrow-shaped with the basal lobes diverging.
Head.	A dense, round inflorescence of sessile or nearly sessile flowers.
Herbaceous.	Leaf-like in texture and color.
Hilum.	The scar on a seed where the funiculus was attached.
Hirsute.	Having rather coarse stiff hairs.
Hispid.	With bristly stiff hairs.
Hydrophyte.	A water plant.
Hypogynous.	Having the calyx, corolla, and androecium below the gynoecium.
Imbricated.	Overlapping.
Imperfect.	Monosporangiate flowers; having only stamens or only carpels.
Indehiscent.	Not opening.

Inferior. Situated or arising below other organs.

Inflorescence. The flower cluster of a plant and its mode of arrangement.

Insectivorous. Plants which capture insects or other organisms for food.

Introrse. Facing inwards.

Involucre. A whorl of bracts subtending a flower or flower cluster.

Involute. Rolled inwardly.

Irregular. A flower with one or more organs of a set unlike the others.

Isobilateral. A flower or organ which can be cut into equal halves by two planes, the halves of the one being unlike those of the other.

Lanceolate. Lance-shaped.

Leaflet. One of the divisions of a compound leaf.

Legume. A simple, dry fruit dehiscent along both sutures.

Ligulate. Provided with or resembling a ligule.

Ligule. A strap-shaped organ.

Linear. A long and narrow organ with the sides nearly parallel.

Loment. A jointed legume.

Loculicidal. A capsule which splits longitudinally through the middle of the back of each cavity or component carpel.

Lodicules. Minute hyaline scales in the flowers of grasses.

Megaspore. The larger of the two kinds of nonsexual spores produced in the flower. The megaspore develops into the female gametophyte.

Megasporangium. A sporangium which produces megaspores; the ovule in seed plants.

Membranous. Thin and rather soft and pliable.

Mesophyte. A land plant adapted to ordinary conditions of moisture.

Micropyle. The orifice produced in the surface of the ovule where the integuments come together.

Microspore. The smaller of the two kinds of nonsexual spores produced in the flower. The microspore develops into the male gametophyte.

Microsporangium. A sporangium which produces the microspores; the incipient pollen sacs in the seed plants.

Monadelphous. Stamens with united filaments.

Monoecious. Having staminate and carpellate flowers on the same plant.

Monosporangiate. Flowers bearing only one kind of spores; a flower with only stamens or carpels.

Mucronate. With a sharp abrupt point.

Nectary. A nectar-secreting organ.

Nut. An indehiscent one-seeded fruit with a hard or bony pericarp.

Nutlet. A very small nut.

Oosphere. The unfertilized egg; the female gamete.

Oospore. The fertilized egg.

Orthotropous. A straight ovule, having the hilum and micropyle at opposite ends.

Ovary. The female organ of reproduction; an egg-producing organ.

Ovate. Shaped like the longitudinal section of a hen's egg.

Ovulary. The ovule-bearing part of a closed carpel or set of carpels.

Ovule. The megasporangium of a seed plant which later develops into a seed.

Ovum. The egg or oosphere.

Palet. The inner of the two glumes inclosing the flower of a grass.

Palmate. Diverging like the fingers of a hand.

Panicle. A compound inflorescence of the racemose type usually of pyramidal form.

Pappus. The bristles, awns, teeth, etc., on the top of the achene in the Compositae.

Parasitic. Growing upon other living plants or animals and absorbing their juices and tissues as food.

Parietal. Borne on the wall of the ovulary, or pertaining to it.

Peduncle. The stalk of a flower.

Pellucid. Transparent.

Peltate. Shield-shaped, as a leaf with the petiole attached at or near the centre of the blade.

Pentacyclic. Having five cycles.

Pentamerous. Five-parted.

Perennial. Growing for many years.

Perfect. A flower having both stamens and carpels.

Perfoliate. Leaves so clasping the stem as to appear as if pierced by it.

Perianth. The calyx and corolla taken collectively.

Pericarp. The wall of a fruit.

Perigynium. The sac-like envelope around the gynoecium of a Carex flower.

Perigynous. Having the sepals, petals and stamens borne on a disc surrounding the gynoecium.

Persistent. Remaining attached after the growing period.

Petal. One of the leaves of the corolla.

Petiole. The stalk of a leaf.

Pilose. With long soft hairs.

Pinna. The primary division of a pinnately compound leaf.

Pinnate. Leaves divided into leaflets or segments along a common axis.

Pinnatifid. Pinnately cleft to the middle or beyond.

Pinnule. A division of a pinna in a compound leaf.

Placenta. The ridge or surface bearing the ovules.

Plurilocular. Having several or many cavities.

Pollen grain. The male gametophyte of seed plants.

Pome. The fleshy fruit of the apple and related plants.

Pubescent. Hairy, especially with fine and soft hairs.

Raceme. An elongated inflorescence with each flower on a peduncle.

Ray. The marginal strap-shaped flower in the Compositae.

Receptacle. The end of the flower stalk bearing the floral organs.

Reflexed. Bent backward abruptly.

Regular. Having the parts of each set alike in size and shape.

Reniform. Kidney-shaped.

Retuse. With a shallow notch at the end.

Revolute. Rolled backward.

Rhizome. An underground stem.

Rotate. With a flat round corolla; wheel-shaped.

Sagittate. Shaped like an arrow head.

Scape. A leafless or nearly leafless stem, coming from an underground part and bearing a flower or flower cluster.

Scapose. Having scapes or resembling scapes.

Scurfy. Covered with scurf, minute membranous scales, as in Chenopodium.

Scarious. Thin, dry, and translucent, not green.

Seed. The matured and modified ovule with a dormant embryo.

Sepal. One of the leaves of a calyx.

Septicidal. A capsule which splits longitudinally through its partitions thus dividing it into its component carpels.

Serrate. With teeth projecting forward.

Sessile. Without a stalk.

Spadix. A fleshy spike-like inflorescence.

Spathe. A bract subtending a spadix as in the Aroids.

Spermary. The male reproductive organ.

Spermatozoid. The male gamete.

Spike. An elongated inflorescence with sessile or nearly sessile flowers.

Spikelet. A small spike; especially the ultimate flower-cluster of the inflorescence of grasses and sedges.

Spore. A modified reproductive cell.

Sporophyte. The nonsexual generation of plants.

Stamen. The organ of a flower which produces microsporangia, which contain the microspores which later develop into pollen grains.

Staminate. Having only stamens or staminate flowers.

Sterile. Not producing spores or seeds.

Stigma. The upper part of the carpel; a special organ of the Angiosperms to catch the pollen grains.

Stipules. Bract-like appendages at the base of the petiole of many leaves.

Style. The narrow top of the carpel or united carpels between the ovulary and stigma.

Submerged. Growing under water.

Succulent. Soft and juicy.

Sympetalous. With petals more or less united.

Synantherous. Having the stamens united by their anthers.

Tendril. A slender coiling organ.

Terete. Circular in cross section.

Ternate. Divided into three segments; arranged in threes.

Terrestrial. Growing on the ground, not in the water.

Tetracyclic. A flower with four cycles.

Tetradynamous. With four long stamens and two short ones as in the Cruciferae.

Tetramerous. Four-parted.

Triadelphous. Having stamens united by their filaments into three bundles.

Trilocular (3-locular). With three cavities.

Trimerous. Three-parted.

Umbel. A determinate inflorescence with all the peduncles or pedicles arising from the same point.

Undulate. With wavy margins.

Unilocular. (1-locular). With one cavity.

Utricle. A one-seeded fruit with a loose pericarp.

Valvate. Meeting by the margins in the bud, not overlapping; dehiscent by valves.

Vascular bundle. The conducting strands in the plant body composed of wood and bast in which water and food materials are conducted through the roots, stems, and leaves.

Vein. One of the branches of the vascular portion of leaves or other organs.

Venation. The arrangement of the veins.

Vernation. The arrangement of the leaves in the bud.

Versatile. An anther attached at or near its middle to the filament.

Verticillate. Whorled.

Whorled. A group of three or more similar organs radiating from a node.

Xerophyte. A plant adapted to desert conditions.

Zygomorphic. A flower or organ which can be cut into similar halves by only one plane.

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